

Hydrilla eradication in King County

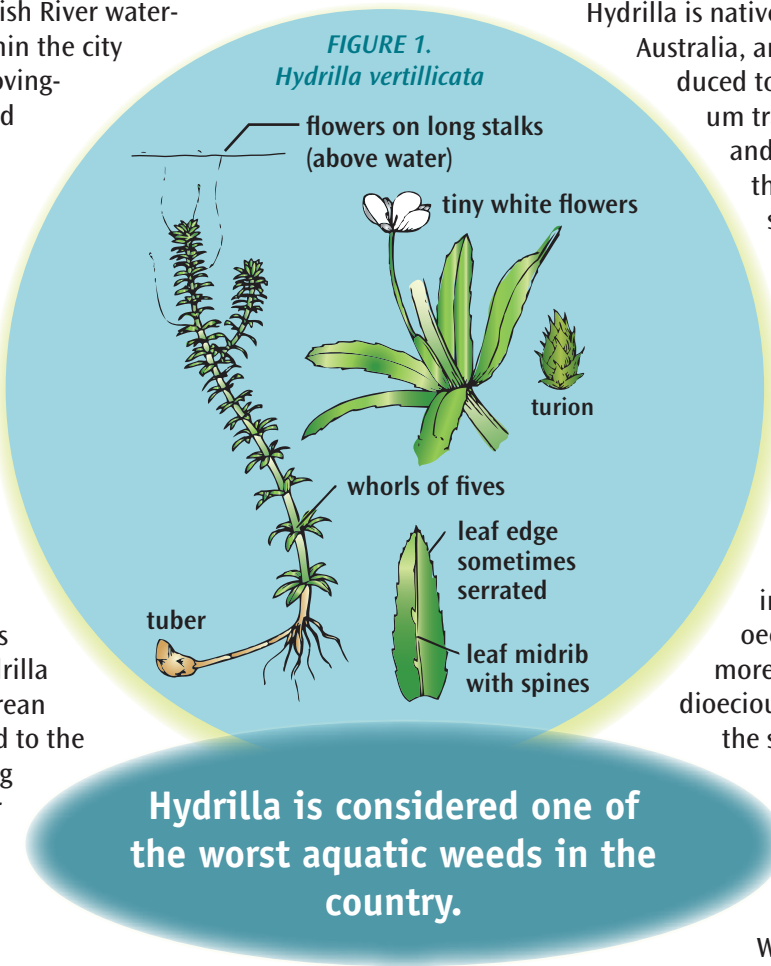
By Beth leDoux and Sally Abella

In 1994, the Class A noxious weed *Hydrilla verticillata* (hydrilla) was discovered to be thriving in Pipe and Lucerne lakes in King County. At that time it was the only infestation in the entire northwest, and it has remained the only one in Washington state to date. Pipe and Lucerne lakes are located in the Green-Duwamish River watershed in King County and within the city limits of Maple Valley and Covington. Although they are named separately, Pipe and Lucerne are connected by a small channel and share similar water quality and ecological characteristics.

The hydrilla population was originally misidentified in the lakes as native elodea (*Elodea canadensis*) until 1994 when King County staff asked for species confirmation from Washington Department of Ecology experts. DNA analysis has since shown that the hydrilla in Washington is likely of Korean origin, most likely introduced to the lakes from someone dumping an aquarium into the lake or from a piece on an ornamental water lily planted in the lake.

Hydrilla is considered one of the worst aquatic weeds in the country. It propagates through fragmentation, tubers, turions (vegetative buds), and seeds, making it a difficult plant to control and eradicate (Figure 1). Hydrilla can degrade the ecological integrity of a water body quickly by forming dense mats that dominate water bodies, choke out native aquatic vegetation, and alter the predator-prey relationships among aquatic animals. These mats can

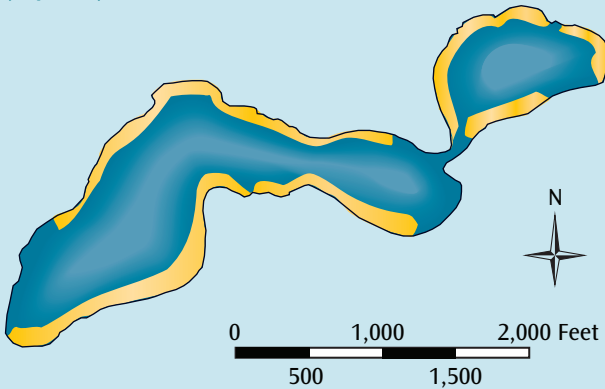
also decrease dissolved oxygen by inhibiting water mixing areas, increase water temperature by absorbing sunlight, create mosquito breeding areas, and negatively affect recreational activities such as swimming, fishing and boating.



Hydrilla is native to parts of Asia, Africa and Australia, and in the 1950s it was introduced to Florida through the aquarium trade. It has since spread north and west to Texas and California, throughout the southeastern states, and as far north as Maine in the east and Washington state in the west. There were at least two different introductions of the plant because two distinct varieties, monoecious (having both male and female flowers on the same plant) and dioecious (all female or male flowers) are found in North America. The monoecious variety is found in the more northern locations, while dioecious hydrilla predominates in the southern United States.

Because further spread of hydrilla could cause expensive and widespread ecological damage, the Washington Department of Ecology (WDOE) and King County Water and Land Resources Division staff took immediate action to begin the eradication process in the lakes once the identification was confirmed. The county took on project management with the goal of eradication, funded through a grant from WDOE. When the cities of Maple Valley and Covington incorporated, they also agreed to help the effort by providing matching dollars for the grant.

FIGURE 2.
Areas of herbicide application in Pipe and Lucerne Lakes
(in yellow).



Herbicide treatments and removing hydrilla by hand by private contractors occurred between 1995 and 2002. While a major decrease in hydrilla was found during this period, the decrease was not quantified and was reported by mapping generalized areas where some hydrilla remained. In 2001 and 2002, only handpulling by divers was used in response to a legal challenge to the permitting processes used to control and monitor herbicide applications. At the end of 2002, a survey of the two lakes showed that hydrilla was increasing in the lakes and a new strategy was necessary.

In 2003, Ecology and King County created an eradication plan that included slow-release granular fluridone herbicide (Sonar PR) and diver surveys. The Water and Land Resources Division began herbicide treatments and contracted for the independent diver surveys. Herbicide treatments were to continue for three years after the last hydrilla plant was found, and then followed with surveys for three more years after the last treatment.

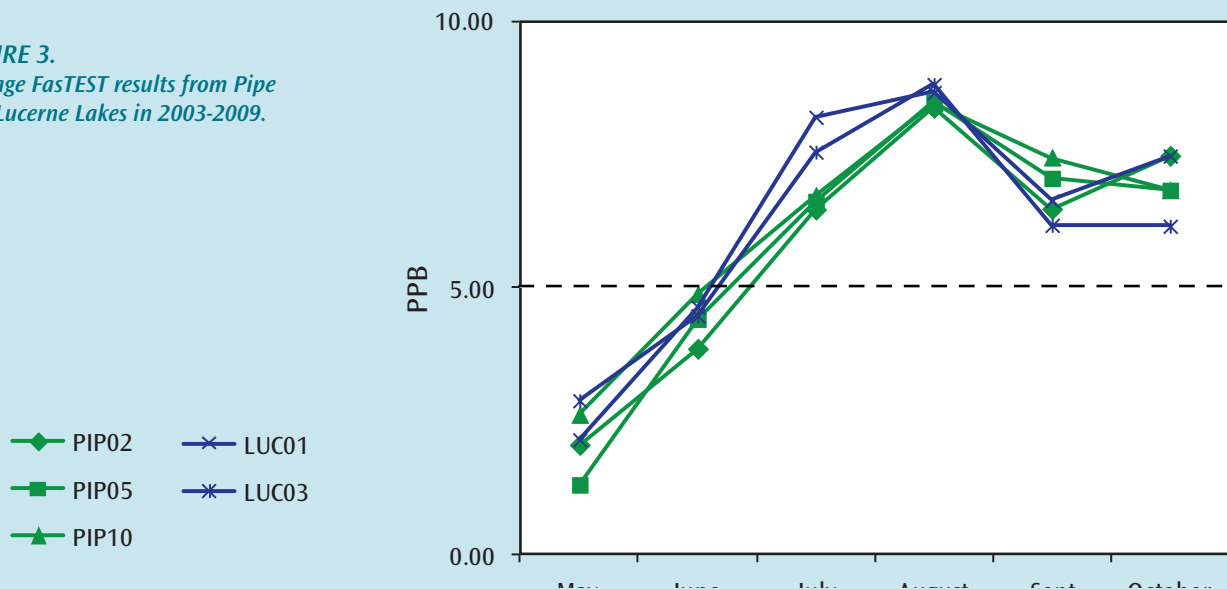
Sonar PR application started in 2003, with a target concentration of five parts per billion (ppb) throughout the growing season. This required at least three applications of granular Sonar PR each season – in late spring, early summer, and midsummer. The herbicide was applied in areas of infestation (Figure 2) with a three acre application buffer to ensure that new shoots from tubers came in contact with the herbicide.

To track herbicide concentrations in the lakes and ensure proper application, water samples were sent to SePro Labs every two weeks for analysis (called FasTests by the company). The chart below shows average results over the summer at different locations throughout the two lakes (Figure 3).

The active ingredient fluridone was generally found at very low levels in the beginning of the growing season, thought to be residual from the previous year of application. The concentrations increased at the beginning of the season and then tapered off slowly from the last treatment through fall.

Surveys were done three times each summer by a contractor using SCUBA divers to assess the effectiveness of the herbicide treatments by counting remaining plants in the lakes. At the same time, shallow water along the shoreline was surveyed by Water and Land Resources Division staff using snorkeling equipment. In 2003, 474 plants were found, while 146 were found in 2004. In 2005, only 23 plants were found and all were in Pipe Lake, while in 2006 only two plants were found. Finally, in 2007 no plants were found in either lake. After 2007, the focus of the surveys shifted from treatment effectiveness monitoring to searching for hydrilla resurgence and recording the rebuilding of the native plant population.

FIGURE 3.
Average FasTEST results from Pipe
and Lucerne Lakes in 2003-2009.



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